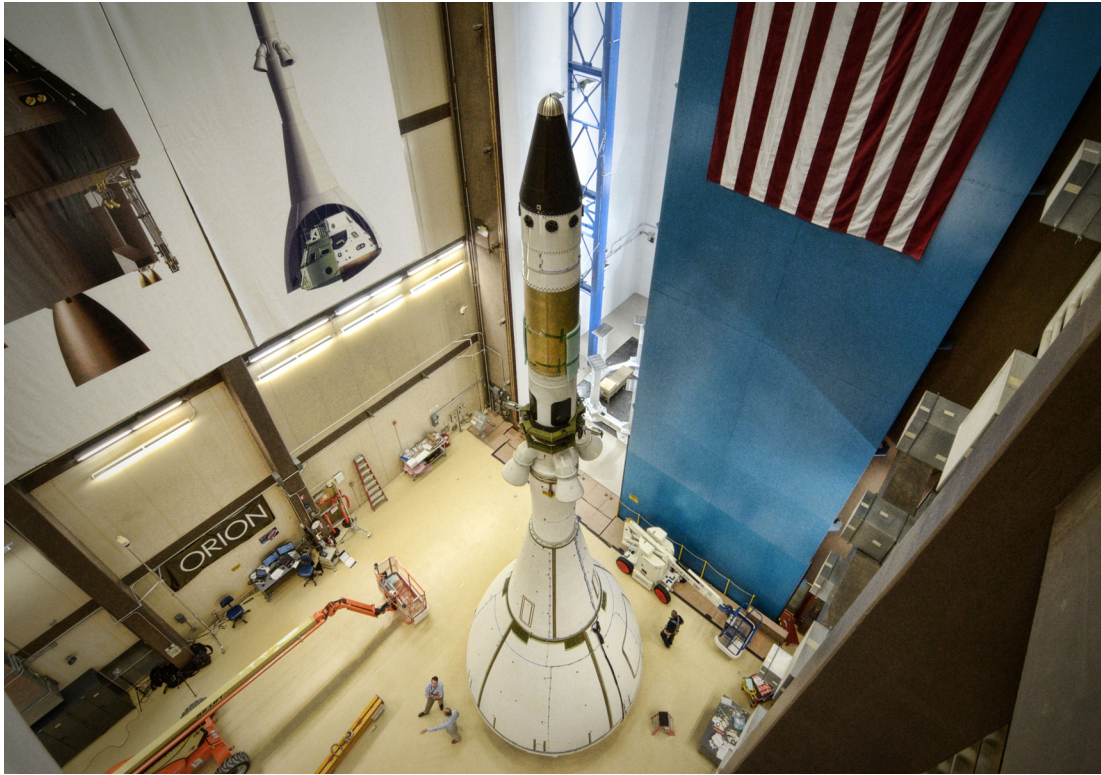


# orion

## Spacecraft Overview



NASA**facts**

For the first time in a generation, NASA is building a new human spacecraft that will usher in a new era of space exploration. A series of increasingly challenging missions awaits, and this new spacecraft will take us farther than we've gone before, including Mars. Named after one of the largest constellations in the night sky and drawing from more than 50 years of spaceflight research and development, the Orion spacecraft is designed to meet the evolving needs of our nation's deep

space exploration program for decades to come. It will be the safest, most advanced spacecraft ever built, and it will be flexible and capable enough to take us to a variety of destinations.

Above: The Orion Ground Test Vehicle is prepared for the Launch Abort Vehicle Configuration Test at Lockheed Martin's facilities in Denver, Colorado.

Below: Orion water basin testing to simulate landing, test flight of Orion's abort system, first space bound Orion being built.



Orion features dozens of technology advancements and innovations that have been incorporated into the spacecraft's design. It includes both crew and service modules, a spacecraft adaptor and a revolutionary launch abort system that will significantly increase crew safety. Orion's unique life support, propulsion, thermal protection and avionics systems in combination with other elements will enable extended duration deep space missions. These systems have been developed to facilitate integration of new technical innovations as they become available in the future.

Orion has been rigorously tested as engineers prepare it for a journey beyond low Earth orbit. A successful test launch at the White Sands Missile Range in New Mexico of the vehicle's launch abort system was completed to verify the escape capability of Orion in the event of emergency on the launch pad. A series of rigorous acoustic and modal tests on the Orion ground test vehicle at Lockheed Martin's test facilities in Denver validated Orion's ability to withstand the harsh environments of launch, abort, re-entry and space flight. In order to simulate the final phases of landing, the spacecraft's parachutes have been proven reliable

through a series of tests at the Yuma Army Proving Grounds. In order to simulate Orion's landing conditions, tests in both the ocean and at NASA's Hydro Impact Basic have recreated how Orion will behave during its final splashdown in the Pacific Ocean. All of these will play a role in the planned uncrewed orbital flight test of Orion in 2014, which will launch the spacecraft 3,000 miles into space in order to reach speeds of more than 20,000 mph before re-entering Earth's atmosphere. This test will provide engineers with invaluable data on Orion's performance in every phase of launch, re-entry and landing. Following this, further tests of the launch abort system will take place as Orion builds toward its first crewed exploration flights.

Orion will utilize advances in propulsion, communications, life support, structural design, navigation and power, drawing from the extensive spaceflight experience of NASA and its industry partners. With destinations including near-Earth asteroids, our own Moon, the moons of Mars and eventually Mars itself, Orion will carry astronauts into a new era of exploration.



Concept rendering of the Orion spacecraft during the proposed 2014 orbital flight test

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